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ABSTRACT

This guide, which is intended for educators interested in implementing preschool programs in developing nations, aims to sustain the working hypothesis that preschool education can be organized entirely around the themes of health and nutrition. Part 1 presents an approach to program development and discusses characteristics and use of the guide. Part 2, the preponderant section, delineates three suggested activities programs which center around: (1) children's diet; (2) child growth; and (3) water in children's lives. The description of each program provides an inventory of problems involving diet and growth, objectives and criteria for evaluation, and specific objectives and activities. Appended are a plan for establishing a program; information about food, diet at various ages, growth, and water. (RH)

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INTRODUCTION

Research on children's overall development unanimously points to the importance of the first six years of life. This is a period of rapid growth, requiring proper health and nutritional surveillance. Progress in the psychomotor, social, emotional and cognitive fields is also great, and justifies the implementation of stimulation programmes.

All of these areas of development are equally essential and children cannot fully unfold their possibilities if one or another of these is neglected or forgotten. Health is essential: without it there can be no joyous well-being. It is a major concern particularly in the developing countries, where it is constantly threatened.

From infancy on, children may participate actively in improving their own health. This participative education, once begun along with early learning processes, should be pursued throughout childhood. Later when the child becomes an adult he or she may help to improve his/her personal health that of his/her family, and teach health habits to his/her children.

The I.C.C. has organized an international seminar-workshop on "the integration of health and diet in the overall development of 3 to 6 year-olds", in the twofold perspective of favouring harmonious overall development through stimulation and education. This document aims at sustaining our working hypothesis, which is that preschool education may be entirely organized around the themes of health and nutrition, health being defined here as a dynamic search for the best possible balance between human beings and their environment. It constitutes the thread which may be woven through the various activities which educators of all kinds may offer to children, and which correspond to their interests and needs and at the same time teach them healthful behaviour patterns.

Part one presents an appropriate work methodology while part two contains some examples, and the appendices provide some basic notions on the themes discussed (food, diet, growth and the role of water). Several programmes have been set up by the participants in the seminar, based on three themes, chosen for their urgency. They show how health and nutrition may serve as a basis for the overall development of 3 to 6 year-olds. They do not contain a series of recipes to be applied literally but are designed as a tool. People in charge of preschool education should contribute to the ongoing transformation of these programmes, and adjust them to the different contexts in which children live.

I. METHODOLOGY, CHARACTERISTICS AND USE OF THIS DOCUMENT

1. PRESENTATION OF THE METHODOLOGY

The presentation of this method should bring the user to reflect on the usefulness of expanding any particular aspect of the proposed programmes, and/or of establishing other programmes more appropriate to local conditions.

Choose a theme judged urgent for children's health

The following themes have been chosen for this document:
- "children's diet"
- "children's growth"
- "water in children's life".

Educational programmes may be based on any health subject.

Make an inventory of the local problems with respect to the theme chosen

This phase requires a survey of the specific context in order to apprehend the problems as objectively as possible. The activities undertaken are then really adjusted to local needs. In the present text, the inventory does not involve any specific region, but the twelve countries represented at the seminar, and is therefore extremely general. The differences between countries and between rural areas, privileged and underprivileged urban areas are not reflected here.

Define the educational objectives

The educational objectives are aimed at the group to be taught in the educational programme; that is, 3 to 6 year-old children. They follow from the health and nutritional needs which have been discovered. They should be carefully unambiguously defined in terms of knowledge to be acquired behaviour to be developed or actions to be mastered. They must be pertinent if the programme is to be appropriate and successful.

The educational objectives are defined progressively. Each theme leads to the establishment of a general objective describing the desired result. This very general objective is then analysed and subdivided into intermediate objectives, and these in turn are detailed, in order to arrive at the formulation of specific objectives.

The specific objectives should be expressed in concrete specific terms realistic with respect to the time required, the resources available and the children's age. They should be measurable. The more specific they are, the greater will be their number. They are used to develop sensorimotor activities (practical skills and know-how) cognitive activities (understanding or knowledge resulting in action or an attitude) and social and emotional activities (attitudes or intimate knowledge).

Define criteria for evaluation

The choice of criteria for evaluation is closely linked with the choice of objectives. Evaluation consists of determining the extent to which the objective set has been achieved. It requires knowledge of the initial situation: what does the child know in this field how does he/she act? It may be done by checking on the performance of a real task (is the child capable of filtering water?). It may also check on an act which shows that the child has acquired a given behaviour (the child washes his/her hands before touching food).

Establish a varied programme of activities for the children

The activities selected are designed:

- to achieve the general and specific objectives defined with respect to health and nutrition education;
- to respond to the needs for stimulation linked with the physical psychosensorimotor social-emotional and cognitive needs of children. Such activities are related to the children's surrounding environment, they are based on their own experience and awaken their interest. They should be numerous, their difficulty graduated in accordance with the children's possibilities and with the progress made by them. They should be constantly varied, so that their curiosity will be stimulated and their attainments consolidated. A single activity in a given field is insufficient for learning. We must plan activities for learning and activities for remembering. For this reason learning always requires time, and repetitious activities. The latter should be conducted in a variety of situations in order to sustain motivation.

The children have the entire preschool period in which to achieve the objectives.

The term "activity" is intentionally repeated often here. It emphasizes the importance of action for children of this age, who will be actors, and not just spectators. It is not enough for them to see things in order to integrate all information about their surroundings: they must learn to observe, but also to use all of their senses: touch, smell, taste, etc. The spoken word is not an appropriate teaching method for their level of development. Children need direct contact with beings, animals and things in order to name them when they are present, at first, then to visualize them, and at last, to recall them when they are absent.

Through action affecting their surroundings children build their personality and enrich their language and thought processes. Doing things produces skills (while "mental" learning remains theoretical) and concrete problems must be solved through action before the abstract world of thought is attained. When children have actually done something, they are then able to project the action into the future, and thus go on to conceive a mental image of it.

The proposed activities should bring children:

- to analyse real-life situations and find solutions by themselves;

- to formulate hypotheses and check them in order to develop their critical sense;
- to plan their actions according to the goals they have set before setting to work;
- to experience true activities: children do not need adult help to play at "make-believe".

These activities should be conceived for use with individuals, small groups and in some cases the whole group. Children do not all need to do the same things or to do them at the same time. They may learn to do things alone provided the spatial organization is appropriate and adults are intent upon stimulating "bored" children.

A "workshop" type of set-up : that is, the simultaneous organization of several activities (as opposed to one collective activity) enables children to move at their own pace and to take advantage of the adult's presence when it is needed. When resources are too scarce for use by all, it provides better access to them.

Such teaching can be serious without being dull. Its approach to the problems of health, nutrition and diet is lively, attractive and natural since it is based on active involvement and personal experience.

Prepare the teaching aids and methods needed for the activities

The activities suggested here do not require any sophisticated or expensive material. They do not call for such "modern" devices as computers, television sets or moving pictures... (which may be used when available). Children are given whatever type of material is available locally: discarded materials (unused objects from homes, packaging material, bits of wood or cloth, etc.), natural materials (seeds, leaves, plant fibres, seashells, sand, earth, water, etc.): anything which is harmless and does not shock the families may be used. More classical items such as paper, crayons, chalk, paint, paste and scissors are helpful, but not indispensable nor must they necessarily be purchased: paint and paste may be made out of elements found in nature.

All of the activities, real or fictional, are based on play.

Pictures are capital teaching aids, since they are representations of reality. They help children's symbolic thought processes to develop, so that they may move from the concrete to the abstract. Deciphering a picture prepares children for reading symbols (stylized pictures) and then writing be it pictographic, ideographic or in letter form.

The child naturally must be familiar with the reality shown in the picture. Pictures do not replace reality, they represent it. We can only recognize what we already know, and each country should have its own repertory of pictures showing objects, people and landscapes. Knowledge can only and should only be acquired through real life. It is logical to proceed from the concrete to the abstract, from what is real to what is symbolic. This is how intelligence actually develops: sensorimotor intelligence precedes symbolic intelligence.

Pictures are the simplest of all medias, and do not require any special technical competencies. They are used in many educational games such as cut-outs jigsaw puzzles or simple board games, appropriate: for the children's age and the theme involved (fruit lotto, vegetable dominoes, food group playing cards, etc.).

Such games are found to be emotionally positive for children, since their rules dictate some obligations, which are counterbalanced by the opportunity to win. They promote the

learning of many conceptual notions otherwise difficult to acquire at that age. The same games based on different themes retain children's attention (once done a puzzle loses its interest). By their repetitiousness and by transposing problems into varied contexts they help children to assimilate some notions.

Furthermore, pictures may be combined in many ways, and used to encourage children to reason properly (sequences), and to exert their imagination and creativity (reading pictures, picture books).

They are therefore a most important teaching aid.

Activities centred around health and food do not exclude other types of play, less learning-oriented but equally necessary for children's psychological balance and for the building of their personality (using material conducive to imitation and role-playing games, such as clothing or cloth for disguises, marionettes, etc.).

2. CHARACTERISTICS AND USE OF THE SUGGESTED ACTIVITIES PROGRAMMES

This document is divided into three parts:

- the characteristics and use of the suggested activities programmes;
- a sample activities programme for each theme;
- scientific information on the three themes: water, nutrition and growth.

For each theme, it presents an inventory of the problems, the overall objective, the intermediate objectives, the specific objectives with their criteria for evaluation and some examples of varied activities.

This approach requires:

- the choice of the most pertinent objectives among those proposed, in accordance with specific local features. For water, for instance, they will differ in areas affected by drought, forested areas, mountainous or coastal regions.
- the definition of other objectives in order to complete these programmes, which do not deal explicitly with the cultural and emotional aspects of the questions.
- the modulation of the suggested activities according to the children's skills and their curiosity.
- that the educational objectives be kept in mind, so that the utmost benefit may be drawn from permanent or occasional local resources.
- that children be observed and listened to, so as to know them well and understand their motivations.

The activities "programmes" presented here should not be applied literally. They are simple illustrations of a working hypothesis and of a proposed methodology: they must be

adjsuted to the surroundings. They are designed to furnish a basis for children aged approximately 3 to 6 years. They have been chosen for an imaginary group of children and the teacher-child group dynamics are absent from them. The motivating situations the links between activities and the children's progression are all artificial: an actual project should be constructed with children, on the basis of their reactions to what they have observed in their own environment, and it should lead to concrete achievements.

For example: following a visit to a newly built hotel in their neighbourhood, the children are enthusiastic about its restaurant. Since they cannot dine in it, they and their teacher decide to organize a restaurant day, during which they will serve meals to the other children. The teacher takes this opportunity to teach the children to recognize local foods, to eat them and to serve clean water with the meal. He/she also organizes:

- mathematical activities, to calculate the amounts of food and crockery needed;
- creative activities, to imitate the atmosphere of the restaurant (decoration, table-cloths, napkins, etc.);
- code-learning activities, for the preparation of the restaurant's menu, the dishes served, the recipes, etc.

II. SUGGESTED ACTIVITIES PROGRAMMES

1. ACTIVITIES PROGRAMMES CENTRED AROUND CHILDREN'S DIET

A. An inventory of problems involving diet and growth

It is made by the teachers:

Lack of regular surveillance of children's growth and health;
Slowed growth starting at age 5 months;
Sudden dietary and emotional weaning ;
Nutrition-related diseases and socio-economic conditions;
Lack of popular information;
Changes in dietary habits;
Economically underprivileged families;
Uneven distribution of food;
Nutritional imbalance;
Some foods insufficiently available at some seasons, in some areas;
Access to health and social structures difficult;
Lack of health workers and of means to train and pay them;
Infectious diseases.

B. Objectives and criteria for evaluation

General objective: children should be familiar with and eat the different foods available

Intermediate objectives

Children should:

be able to recognize foods

Specific objectives	Evaluation
Children should be able to:	Before activities have begun: take note of foods known and eaten by the children. At the end of the activities, can they:
1. Identify, foods using all of their senses	name the foods shown to them

Specific objectives	Evaluation
2. distinguish good food from spoilt food	
know how to prepare foods	
3. prepare or participate in the preparation of various foods (washing, peeling, pressing, cooking and avoiding accident)	explain how to prepare them cook food or participate in cooking it. Respect and understand some safety recommendations
know the right way to eat them	
4. suggest balanced nutritious and culturally appropriate menus (taste, smell, type of food, etc...)	
5. present aesthetically pleasing, appetizing dishes	
recognize locally available food	Do the children eat a greater variety of foods Do they know the food group
6. group food in categories	
a) know what is edible and what is inedible	
b) know where they come from: region - home country - foreign country - animal raising - farming industry - gathering	
c) know at what season they are available:	
d) know their shape, consistency, colour, smell and taste	
e) know their state: liquid, solid or gas	
f) know their dietary category: vegetables, meat, fish, fruits, grains, legumes, spices	
g) know how they are eaten: raw, cooked, hand or industrially transformed:	know whether foods are eaten raw or cooked?
understand the importance of growth	

Specific objectives	Evaluation
7. explain how foods help the body to grow and be healthy	
understand the social aspect of food	
8. explain that their diet has changed with their age (breast milk, greater variety, solid foods)	

C. Specific objectives and activities

Specific objective (1): children should be able to identify food, using all of their senses.

Motivating activities: Take the children to visit a market, a grocer's shop, a bakery, a supermarket, an animal farm, a field, a home garden, a mill, a silo, a slaughterhouse, a factory.

ACTIVITIES	DESCRIPTION OF ACTIVITIES. TEACHING METHODS
Oral expression	Preparing the visit to the market (1)
	Question the children to find out what they know about food and how to procure it
Visiting the market	Oberve the merchants' stands. Children talk with the accompanying adults and with merchants
	After the visit
Oral expression	Encourage the children to tell about the visit
	Teach them the names of foods
	Pictures of foods
	Pictures of market scenes
Stories	Tell local stories or from other countries about markets and foods (2)
	Picture sequences illustrating the tale
	Have the children invent stories on the same theme

(1) Plan for sufficient supervision (include parents if possible) to avoid accidents and facilitate discussion with the children.

(2) Resource-people: story-tellers, educators, parents, marionettes for telling stories, printed books or books made by adults or by the children, illustrating the story.

ACTIVITIES	DESCRIPTION OF ACTIVITIES. TEACHING METHODS
Play	Role-playing: play market scenes
	Symbolic games: organize play corners in which children may play at shopkeeping
Poems Nursery rhymes Songs	Teach them some poems or have the invent poems, nursery rhymes and songs about foods and the market
Graphics	Have them draw their impressions of the market
Arts and crafts	Make imitation foods by cutting, pasting and shaping materials, and create games
Perceptual activities	Play at recognizing foods by their smell taste or feel
Logical-mathematical activities	Introduction to topology: have them draw the route to the market, sort out foods according to their origin local, home country or foreign
Introduction to technology	Make a stand for selling (of wood or cardboard) Make a tray on which to present food
Stimulating interest in science	Grow fast-growing plants. Observe what occurs. Experiment and observe the cultivation of seed crops (peanuts, beans, etc.) Discover the respective role of water, earth and light.
Physical activities	Circuits to be travelled with a basket, to collect foods deposited in different places, with obstacles to be overcome while carrying the basket on the arm or head.
Educational games	Series of pictures showing the phases of plant growth.
Oral expression	After handling various foods (concrete objects), the children may now handle their symbols (photos realistic, and stylized pictures): - name foods recognized on a photo or picture - recognize a food product on a picture
Logical-mathematical activities	Group foods according to their origin
Language and educational games	Pictures representing foods, scenes related to food, meals and food-related professions
	Picture books: sequences of pictures showing the route travelled by food: from production... to the table.

Specific objective (2): Children should be able to distinguish good food from spoilt food.

Motivating activities: Spoilt food (mouldy fruit, spoilt fish, rotten eggs, wormy meat, etc...)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation	Observe the spoilt food to discover what it is like
Oral expression	Have the children express their perceptions of the spoilt food (colour shape, smell, different consistency)
	Compare the spoilt food and the same food good to eat, learn the words designating these states
Graphics	Make drawings and paintings of the spoilt food
Stimulating interest in science	Observe open fruit exposed to air, and moisture
	Observe a cracked egg, fish and meat exposed to air, heat and moisture
Practical activities	Make a food-safe
Perceptual activities	Recognize mould, rot, rancid food
	Compare the smell of a fresh food and of the same food when spoilt
Mathematical activities	Sort out spoilt and unspoilt foods
Educational games	Pictures of spoilt foods and of good food - lotto

Specific objective (3) : Children should be able to prepare or to participate in the preparation of various foods (washing, peeling, pressing, cooking and avoiding accidents)

Motivating activities : Prepare a snack for a festive occasion (a child's birthday or the end of the school year)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation	Observe the foods to be prepared and eaten
	Visit someone who is cooking
Oral expression	Encourage free expression about food and how to eat them
	Teach words pertaining to cooking (cut up, peel, broil, boil, hot, cold, warm, etc.)
	Pictures of foods, cooking ustensils and kitchen scenes

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Written expression	Draw foods
	Write a recipe (drawings or symbols)
Creative expression	Give shapes to foods
	Make pictures of foods using different techniques (pasting, cut-outs)
	Decorate a place for the celebration
Mathematical activities	Sort out foods according to the way they are eaten
Educational games	Sequences of pictures showing the various phases of preparation
Practical activities	Prepare fruit juices, fruit salads, purée fresh or cooked fruit, raw vegetable salads, etc.
	Use local cooking utensils: knife, grater, pounder, mortar, fruit-presser, vegetable grinder, etc...
Preparing for activities	During cooking activities, observe the signs of heat or fire: steam, the colour of coal, and live charcoal, of burning wood, embers and flames (1)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Learning safety	Preparing and cooking foods: paying attention to what is occurring moving calmly being careful about one's clothing (avoid flowing garments, long, wide sleeves) keeping saucepan handles out of people's path protecting one's hands when picking up a hot dish or other hot object using and putting away sharp, pointed tools
Self-expression activities on the theme of fire	Poetry, songs, drawings, etc. Tell what happens when someone is burned, observe the scars
Educational games	Cut-out puzzles representing kitchen scenes: the pieces to be fit in are objects to be put away (knives, scissors, sauscepans, etc.)

(1) All food-cooking activities are dangerous and should be done in small groups, so that no child is out of the adult's sight at any time. The source of heat should be stable.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Physical education	Keeping one's balance: walking on a line drawn on the ground or on a beam, holding an empty container, then a full one, in one's hand
Educational games	Raw and cooked food dominoes and lotto
Perceptual activities	Recognizing the sounds and smells of cooking
Symbolic games	Organize a kitchen corner with discarded objects (broken cooking utensils). This kitchen corner should be permanent, and constantly enriched
Creative activities	Make cooking utensils out of clay or discarded materials
	Make a heater, a hearth, kitchen furniture depending on local habits

Specific objective(4) : Suggesting nutritious, culturally appropriate balanced menus

Motivating activities: Daily diet, a festive meal, a picnic meal, a visit to a market, to a supermarket

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation and expression	Have children tell what they eat daily (where food comes from, its taste...), and on special occasions (religious, family or national holiday,...
	Have children draw and/or code the different phases of the meals and snacks eaten by them, their younger brothers and sisters, the parents and grandparents
	Make mobils using all of the elements of a meal
Practical activities	Prepare a meal or a snack for the children, distribute the food, serve it, etc.
	Perform the customary mealtime rituals
Symbolic games	Use make-believe foods (discarded objects or pictures) to prepare meals for a baby, for oneself, for a group of children or a family
Mathematical activities	Divide a dish into portions for a number of people
	Notions of quantity: whole, half, quarter, a spoonful, a pinch, a plateful, a glass, a little bit, lots of, as much as...

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Learning to decipher codes	Have children compose a menu
Motor activities	Cards representing different foods are placed in an area marked with clues. The children must follow the trail and find the foods, so as to constitute a qualitatively and quantitatively satisfactory meal
Scientific discovery activity	On the basis of what they eat, children should discover that they need to eat foods of all origins: plant, animal...

Specific objective (5): Children should be able to present aesthetically pleasing, appetizing dishes

Motivating activities: Prepare a dish (for a festive occasion or any other one). Enjoying a dish is as important as preparing it (1).

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation	Observe the shapes, colours and consistency of foods
Mathematical activities	Discover shapes and their names: a slice, a round slice, a cube, a ball, an oval shape
	Notion of thinness and thickness
Language arts	Using reproductions of still-life paintings, pictures taken from magasines, drawings or paintings by local artists or reproductions of local works of art (sculpture, etc.)
Practical activities	Prepare a dish, paying attention to the colours and shapes of foods
	Serve the food. Create a convivial, festive atmosphere
Graphics	Draw a dish the children have already prepare

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(1) This provides an opportunity to strengthen ties between children, and to ground them culturally. Family rituals with respect to eating should be respected: in some countries meals are a special time for talk, while in others they must be taken meditatively, in silence. Regardless of the children's culture, food should be eaten calmly, in a practical, comfortable position and a pleasant atmosphere, without hurrying so children have time to chew well and to taste the food. Food containers, faces and hands should be clean.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Creative expression	Take some foods and invent dishes Shape and decorate clay, paper mâché, etc. to represent dishes
	Cut and paste objects to represent a dish (seeds, pieces of paper, pictures from a catalogue, bark of trees, leaves, capsules, etc.)
	Place natural materials on the ground so as to make decorations resembling the preparation of a dish (try to imitate a well-known dish)
Symbolic games	Play at preparing decorative dishes in the kitchen corner, using play material given for this purpose, or outdoors, using wet sand and containers to mould it

Specific objective (6): Children should be able to group foods in categories

Motivating activities: All activities centred around food (visits, cooking).

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Discovery activities	Make surveys, with the children, on where foods come from
Oral expression	Question parents, shopkeepers, farmers, craftspeople
Observation	Do whatever on-the-spot observation is possible (the children should be able to identify foods, using all of their senses)
	Discover the avenues followed by different foods so that the children may group them according to their origin
Gardening	Plant seeds
Animal-raising	Raise small animals for eating
Written expression	Show the different phases in producing a food (from seed to vegetable, or to flour, or to fruit...
Creative expression	Painting, cut-outs, collages
Logical activities	Sort out real foods or representations of foods according to various criteria (taste, origin, consistency, type of preparation, cost)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Introduction to learning codes	Make a file: help the children choose a symbol representing each category of foods and class foods in them
Educational games	Pictures showing fruits in an orchard, vegetables in a garden, scenes of farm work, market stands, prepared dishes

Specific objective (7): Explain how food helps the body to grow and be healthy

Motivating activities: Hunger or thirst, a meal or a snack, a nursing baby

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Have children express what they feel when they are hungry or thirsty, and what they feel after eating or drinking
	Tell stories where eating is correlated with height or weight (an ogre, a voracious animal)
Observation	Why do babies cry? How do mothers stop their crying? What do babies do when they are no longer hungry?.
Graphics	Draw a nursing baby, a giant, an ogre
Creative expression	Make a mobile showing a giant
Educational games	Sequences of pictures: a baby crying, then nursing, then smiling

Specific objective (8): Children should be able to see that their diet has changed with their age (breast milk, greater variety, solid foods)

Motivating activities: Seeing babies (young brothers and sisters, neighbours)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Ask children to observe what babies eat, to ask adults about babies' diet, and their parents about what they ate when they were younger
	Observe animals: what they eat when young, when adult

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Songs and nursery rhymes	Teach songs about food (lullabies, for example)
Graphics	Draw a nursing baby or animal
Practical activities	Prepare porridge for a baby
Logical-mathematical activities	Distinguish between what babies eat and what they cannot eat
Educational games	Play at using feeding dolls made of cloth, paper mâché, etc., dishes made of discarded objects
	Sequential pictures, photos: a nursing baby, a baby eating porridge a child with teeth, eating a solid food a nursing kitten, a cat eating meat
Perceptual activities	Taste foods and say who can eat them: infants, babies, children, adults

2. ACTIVITIES PROGRAMME ON CHILD GROWTH

A. Inventory of problems: see those listed in the chapter on diet

B. Objectives and criteria for evaluation

General objective: Children should be motivated to check on their own and other children's growth

Intermediate objective

Children should:

Be able to participate in the surveillance of their own growth

Specific objectives	Evaluation
Children should be able to:	When the activities are terminated, can children:

Specific objectives	Evaluation
1. Measure their own and other people's height	Do what is necessary to measure and weigh?
2. Compare heights (theirs and someone else's)	
	Express a difference in height or weight in correct fashion?
3. Participate in measuring their own weight	
4. Compare weights	
5. Take care of scales	Take proper care of scales?
6. Express their physical and mental evolution from intrauterine life on (weight, height, strength, manual skill, language)	Tell what progress they have made since their intrauterine life?
	Express (tell, draw) the story of their diet since birth?
	Express the relation between diet and growth?
7. Describe the influence of some diseases (diarrhoea) on health	Say that disease weakens you and may cause weight loss?

C. Specific objective and activities

Specific objective (1): Children should be able to measure their own and other children's height

Motivating activities: Organize height-measuring sessions

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation and oral expression	Measure each child with a measuring stick or along a wall (using a tape measure)
	Have the children express the succession of acts (remove your shoes, stand with back to wall, heels together, etc. (1)

(1) The richer the child's vocabulary, the more specific words should be demanded: younger children speak of feet, legs, heads, while older ones speak of heels, calves, etc.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Practical activity	Measure another child: show the child's height by placing a mark on the wall or on the stick
Introduction to technology	Make a measuring stick (using flat pieces of wood, cardboard)
Symbolic games	Measure dolls of different sizes, made of different materials: measure them standing up or lying down
Graphics	Identify each child's height by a symbol or a drawing on the wall

Specific objectives (2): Children should be able to compare heights

Motivating activities: Organize height-measuring sessions

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Practical activities	Measure children repeatedly and have them compare their height (I'm the same, I am taller, I have grown)
	Draw the outline of hands (or feet) and compare them (at the beginning and end of the year, and with other children
Oral expression and logical-mathematical activities	Compare children's height two by two, by placing them side by side or back to back
	Have children compare their height with adults' heights
	Rank hand-made dolls by order of height
	Rank silhouettes of people of varying height, from the smallest to the tallest, putting those with the same height together
Graphics	Draw oneself and other people, respecting height relationships
Educational games	Cut-out puzzles: the pieces to be fit in are people, animals or objects of different sizes
	Make a life-sized chart of height and post it
	Cut out strips of paper for the children's heights. Decorate them and paste them on the chart

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Arts and crafts	Make an imprint of one's hand or foot on clay, or by dipping it in a liquid dye
Logical-mathematical activities	Compare the outlines of different hands or feet, those of different children, of children and adults, of children and babies
Physical activities	Stand on your toes to be taller
	Play on a seesaw: the lighter child goes up, but may use strength to bring him/herself down
	Climb as high as possible, jump higher and higher, throw a ball higher and higher
Symbolic games	Bring in old clothing, bags, shoes, pieces of cloth, so that the children may dress up and disguise themselves as other people (baby, mother, etc.)
Role-playing	Play scenes from family life
Gardening	Plant beans, arrange poles and take note of growth

Specific objective (3): Children should be able to participate in measuring their own weight

Motivating activities: Organize child-weighing sessions following a visit to a health centre. Activities similar to those used for the notion of height and for measuring height may be developed for weighing and the notion of weight.

Specific objective (4): Children should be able to compare weights (using their own strength, using scales)

Motivating activities: Weighing sessions, purchasing of weights, notions of weight and quantity

Specific objective (5): Taking care of scales

Motivating activities: Taking care of borrowed scales, of scales one has built, of family or community-owned scales.

Specific objective (6): Children should be able to express their physical and mental evolution from infrauterine life on (weight, height, strength manual skill, language, etc.)

Motivating activities: Make a book showing the child's history (history of physical growth and of his/her personal achievements).

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Ask children to request that their family tell the story of their life, from birth on, using pictures and photos
Graphics	Children draw pictures of themselves as babies
Mathematical activities	Represent the height of a newborn (using a strip of paper or cloth, a branch, a creeper, etc...)
	Sort out clothing: on one side, baby clothing, on the other, clothing unsuited for babies
Physical activities	Have children imitate the evolution of their posture since birth (coiled up, on one's back, on one's stomach, on one side or the other, crawling, walking on all fours, pretending to be small, to be big)
Gestural expression	Imitating babies
Oral expression	Imitating babies' babbling, beginning to speak: have children speak about their own progress with respect to language Have children express their progress: I can dress myself, I go to the toilet alone, I can peel a fruit, etc.
Story-telling	Tell stories in which younger children are protected by older people
Educational games	Sequences of pictures and/or comic strips: from baby to adult, the evolution of posture, of diet, of abilities
Discovering codes	Represent actions by drawings, write down what they mean
	Have children check the intersection of their name with the actions they have mastered

		Drawing I can dress myself	Drawing I can wash myself	Drawing I can peel a fruit	Drawing I have grown
Photo or code representing the child + written name	Marême	+			
	Kiran		+	+	

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
	As the child acquires new abilities, the chart grows larger. It may be included in a personal album, in which the child attempts to show his/her growth and progress.
Songs	Teach songs usually sung to babies, for use with dolls or little brothers and sisters
Practical activities	Raise chicks and observe their evolution, from egg to a hen
Visits	Go to see new-born animals: follow their growth (note their progress: they suck at their mother, they eat by themselves)

Specific objective (7): Children should be able to describe the influence of some diseases (diarrhoea) on health

Motivating activities : A child is absent, a child is sick

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Have children tell what they feel when they are sick: are they hungry? do they want to play? What are the negative aspects (pain, fatigue, weakness) and the positive ones (you receive special care and attention)
Mime	Have children mime scenes showing them when they are sick
Symbolic games	Arrange a corner for "playing doctor" or "playing nurse"
	Encourage various games: a child or a doll has diarrhoea, a sore throat, coughs, has a cold, a "boo-boo", a rash... she isn't hungry, doesn't play: why? the doll has lost weight... her dress is now too big: what has happened?
Practical activities	Prepare a drink for a child who has a fever or diarrhoea
	Weigh a child who returns after a sickness (compare his/her weight with a previous weight)
Graphics	Have the child draw a picture of him/herself - of his/her face - during the sickness

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Educational games	Drawings or pictures showing healthy children and sick children
	Books for children: children in a hospital
	Toys and pictures (health booklet, growth chart, medicine, etc.)
Discovery	Look around you, discover the signs that make you think about sickness or health (red cross, green cross, white jacket, medicine, stethoscope, etc.); reproduce them in different ways
Mathematical activities	Sort out objects that make you think of sickness or health

3. ACTIVITIES PROGRAMME CENTRED AROUND WATER IN CHILDREN'S LIFE

A. An inventory of the problems: (This one has been made by educators)

Lack of water
Poor quality of water
Storage of water
Distribution of water
Maintenance of source of water and of facilities
Diseases linked with water
Pollution of water
Environmental sanitation

B. Objectives and criteria for evaluation

General objective: Children should be able to use water in a healthful way

Intermediate objective

Children should be able to:

Select the best available water for drinking

Specific objectives	Evaluation
Children should be able to:	Before beginning activities:
Identify	Question children about the sources of water and note the answers
1. The different sources of water 2. The nature of the water 3. Different ways of getting drinking water	Question children about the origin of the water they drink
	After the activities:
	Children should be able to list the sources of water, and should know which ones furnish drinking water
Establish the link between water and life: - their own life - animal life - plant life (positive and negative aspects)	After the activities, are children able to:
4. Describe the different uses of water	Name what pollutes water
5. Identify the main causes of water pollution in their surroundings	Say that all living beings need water
6. Establish the relationship between polluted water and disease (diarrhoea and other diseases)	Say that polluted water can make you sick
Participate in water conservation	
	See whether the children:
	Do not waste drinking water thanks to changes in the way they use it
7. Participate in water conservation	Know how to keep water clean
	Relieve themselves and discard waste in the proper places

C. Specific objectives and activities

Specific objective (1): Children should be able to identify the different sources of water

Motivating activities: Visits to water supply points (well, marigot, river, sea...)

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Visit to a well	• Preparation for the visit (1)
Oral expression	Question children to assess what they know about wells: do they know any? are there any near their home? of what use are they? What does a well mean for them and those around them (water, danger, etc.)?
	Inform children of the dangers of wells, and help them to decide safety measures (2)
	• Around the well
Observation and oral expression	Encourage children to observe and to ask questions. How is water drawn from a well?
	Observe the water that has been drawn: its characteristics (transparent, muddy, cool, etc.)
	Is the well protected? is it covered? is there a separate watering place for animals?
Educational games	Pictures, photos or drawing of a well. Jigsaw puzzle Sequences of pictures: the different phases of drawing water
	Cut-out puzzles: the pieces to be fit in are the container for drawing water, the parapet of the well, the pitcher for carrying water, etc.
	• After the visit
Oral expression	Have children talk about what struck them during the visit. Tell them why wells are dangerous, the reason for the parapet
	Teach new words (such as: the parapet of a well)
Graphics	Have children draw what struck them during the visit
Logical-mathematical activities	Name the different places on the route (have them mention the landmarks)
Motor activities	Dig holes to make a well
	Use a rope like the one with which water is drawn: songs and games using ropes, rope-climbing, etc...

(1) Plan for sufficient surveillance. Invite parents, encourage their participation.

(2) Have only a few children at a time around the well (the adult should be able to see all children at all times). In the meanwhile, the other children should be kept busy with games, observation, etc.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Creative activities	Mould clay into a parapet, a container, etc.
	Make a rope (braid it)
Awakening interest in technology	Make a pulley and run it
	Dig a well: discover what must be done to prevent it from collapsing (use stones, pieces of wood)
	Build a parapet: make bricks (make ciment, make cardboard moulds for pouring bricks, etc.
Songs and stories	Teach local songs and stories about drawing water
Practical activity	Draw small amounts of water, individually, and only if the well is absolutely safe for the child
Learning about physical phenomena	• About the risk of falling:
	The depth of a well. Experiment, concretely, to discover what happens to things when they fall from great heights (tie this in with children's body, when they fall during play, for example)
	Drop things - hard, soft, brittle, hollow and full things - from different heights, and see what happens
	• About water power
	Observe the environment, see how water power is used (to transport wood, for example)
	Observe the direction in which water flows: place marks on objects whose weight and shape varies, and see how far they go and how long it takes them to travel that far.
	See what happens to the objects, as well (objects placed in water, but also tree bark, stones, rocks, pebbles, etc.)

The visit to a well is simply an example: other visits may also be organized: to a marigot, a water tower, a lake, a river, a dam, etc.). The same types of activities should be used, with emphasis placed on learning safety.

Learning about physical phenomena	Observe aquatic animals, semi-aquatic animals. How do they breathe? Why? What happens when you are unable to breathe, when you have water in your nose, when you swallow the wrong way?
Perceptual and musical activities	Recognize the sound of different sources of water: try to imitate them Listen to music related to water

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Art education	Local paintings, classical masterpieces showing the sea, or water
	Poetry about water
Introduction to technology	Make a drainpipe to catch rainwater
	Go to see a pump or a windmill at work
Stories	Traditional tales and local stories in which water is the theme (floods, drought, springs dried up, etc.)

Specific objective (2): Children should be able to identify the nature of water

Motivating activities: Observation of water coming from different sources

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation and oral expression	Observe water from different sources (marigot, lake, dam, etc.)
Play with water	Arrange a "water corner", with various containers, where children may handle water
Graphics	Have children draw their own image reflected in water
Mathematical activities: quantitative notions (full, empty, little, much, etc.)	Compare the same amount of water poured into containers of different sizes and shapes (1)
Perceptual activities	Play developing the sense of touch: recognize which water is coldest or warmest, recognize dry, moist and wet objects
	Play developing auditory discrimination: recognize the sound of water dripping or running rapidly, or of pebbles in water
	Play developing visual discrimination: recognize clear water, cloudy, muddy, soapy, stained water, etc.
	Play developing discrimination of odours: smelling different types of water (clean, stagnant, soapy, etc.)
	Play developing discrimination of taste: recognize pure, salted, sweetened, acidulated, carbonated, bitter water...

(1) The notion of conservation of quantities is only acquired at a later age, but a prior learning process is required.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Learn appropriate vocabulary (to float, to sink, to wet, to overflow, to splash, etc.)

Specific objective (3): Children should be able to identify the different ways of obtaining drinking water

Motivating activities: The children's own experience

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Have children tell about their home situation (source of water, storage, use)
Graphics	Have children draw what they have told
Experimenting	Let muddy or sandy water settle, observe an object in clear or muddy water
	Filter water using various materials
Observation	Observe the residue and identify it
Awakening interest in technology and creative expression	Make a filter Make a clay mould of a filter

Specific objective (4): Children should be able to identify the different uses of water

Motivating activities: Children's personal experience and observation of local practices

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Talk with children when they drink: try to have them discover what made them thirsty (heat, spicy or salted food, etc.)
	Have children talk about urine and sweat: where they come from, what they are.
	Have children tell how water is used in their home (food, drink, cooking, washing food, washing dishes, laundry)
Practical activities	Hand-washing, washing up, dish-washing, laundry, watering plants

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation	Have children observe themselves after physical exertion or time spent in heat
	Make hand and footprints on a dry surface
	Observe what water is used and, when possible, what happens to it after use
Practical application	Make recommendations for use of water
Physical activities	Bathing and playing with water, playing with one's body in water
Educational games	Sequences of pictures, jigsaw puzzles, cut-out puzzles representing washing up, hand-washing or plant-watering scenes
Experimenting and observation	Place flowers in a transparent container filled with water, note the water level and have children talk about it

Specific objective (5): Children should be able to identify the main causes of water pollution in their surroundings

Motivating activities: Children's experience and environment

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Observation and oral expression	Collect water of various origins and say what it contains (observe the surroundings after a heavy rainfall)
Graphics	Draw what is contained in water
Experimenting	Let muddy water settle in a container. Filter the water, observe the deposit on the filter
Visit	Visit and observe various sources of water and the area around them (presence of animals, plants, waste, improvements). Have children describe the situation.
Logical-mathematical activity	Sort out pictures of animals and plants, showing which ones live in water
Observation-experimenting	Observe water in an aquarium, how it is polluted, participate in keeping it clean
Graphics	Draw a pond, and the plants and animals seen there

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Creative activities	Make a scene representing a source of water, using materials collected during the visit (twigs, leaves, pebbles, sand, shells, etc.)
Awakening interest in science (notion of the infinitely small)	Make children aware that water is filled with living beings, plants and animals. Some animals are too small to be seen by the naked eye: use a magnifying glass
	Have children discover that there may be something in water even if it is invisible: taste sweetened or salted water. Boil water and observe the deposit
	Why does carbonated water fizzle?
	Dry out aquatic plants. Learn their names
Awakening interest in technology	Make and use a filter

Specific objective (6): Children should be able to establish the relationship between polluted water and disease

Motivating activities: Children's experience; for instance, a child with diarrhoea.

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Oral expression	Telling about the sickness
	Question children about their opinion
Educational games	Sequences of pictures and/or comic strips about the different phases of diarrhoea: a child drinks polluted water, has stomach pains, has diarrhoea
Visits	Go to the health centre, question the nurse
Graphics	Ask children to draw pictures of themselves when sick
Gestural expression	Mime sickness
Symbolic games	Set up a "doctor" corner:
	Make marionnettes
	Play a scene about the disease and how to treat it (salted, sweetened herb tea)
Practical activity	Prepare an herb tea for a child with diarrhoea: (cleanliness rules, recipe, how to prepare it)

Specific objective (7): Children should participate in water conservation

Motivating activities: Everyday experience at home and in the group

ACTIVITIES	DESCRIPTION OF ACTIVITIES TEACHING METHODS
Visit to a source of water for use in connection with eating or drinking	Make children aware of the need to protect it (what is acceptable, what is not acceptable)
Motor activity	Learning to use water without wasting it or polluting it when food or drink is involved
Language	Have children tell how they use water and explain their acts
Developing logic (notion of before and after)	Have children enumerate and draw (or represent symbolically) the different phases of use of water
Discovering codes	Draw the different operations required for proper use of water and post above a reservoir of drinking water
Gestural expression	Mime these operations
Practical application	Learn to wash hands correctly but without wasting water or dirtying it needlessly
	Use the specially designated places for relieving oneself
Logical activity	Note the location of toilets, garbage depots, etc., with relation to kitchens and water supply points
Creative activity	Make a wastepaper basket or a garbage can and use it

APPENDIX 1

PLAN FOR ESTABLISHING A PROGRAMME

1. CHART 1. CHILD DEVELOPMENT

General objective: Harmonious child development

Intermediate objectives (1, 2, 3)

1. Physical and motor development

Specific objectives

Development of the body, of broad and discriminating motor functions, motor coordination, motor and sensory coordination, and of the senses.

Types of activities

Physical, manual, sensory, perceptual.
Play involing danse, rhymes, hands, skill, equilibrium.

2. Intellectual development

Specific objectives

Development of laterality, creativity, logic, attention, curiosity, symbolic thought processes.
Acquiring concepts and knowledge.

Types of activities

Oral, graphic, manual and motor expression, arts and craft.

- of a logical-mathematical nature;
- awakening interest in science and technology.

Play involving perception, orientation, building, coding-decoding, educational games.

3. Social and emotional development

Specific objectives

Development of the personality.
Social integration.

Types of activities

- social and collective.
- oral, gestural, body, musical and plastic expression.

Symbolic, collective and role-playing games.

II. CHART 2. ESTABLISHING THE PROGRAMME

Learning about life	Children's harmonious development in their own surroundings
1. Select a high-priority theme ex : children's diet	
2. Make an inventory of the problems	
3. Educational objectives	
General objective or theme	General objective:
knowing and eating the different foods	harmonious overal child development
4. Intermediate objectives (4.1, 4.2, 4.3...) ex : recognize foods	Intermediate objectives
5. Specific objectives	Specific objectives
6. Specific activities	Types of activities
7. Evaluation	Evaluation

APPENDIX 2

SOME INFORMATION ABOUT FOOD, DIET AT VARIOUS AGES, AND GROWTH

1. FOOD

Families eat many, varied foods, which act in different ways. These different foods fulfill the nutrition requirements of human beings, and enable them to stay alive, develop, grow, sustain some physiological processes such as pregnancy, be active, etc. These functions are fulfilled by six types of substances or nutrients, which are present in food in varying proportions: water, proteins, carbohydrates, lipids (fats), minerals and vitamins.

Each of these nutrients plays a very specific role:

- Water, proteins and some minerals fulfill the body-building requirements; that is, those linked with children's growth, maintenance during adulthood, and reconstruction following a disease.
- Carbohydrates and fats are more specific furnishers of the energy required for the body to function. Proteins also participate in this, but to a lesser extent: this is not their main role.
- Most minerals and vitamins are needed for organization and control purposes.

There are many ways of grouping foods. The classification proposed here is based on the main nutritive value and the food's role in the body because of this main nutrient.

1) Body-building foods

These are foods which are rich in animal or plant protein.

Body-building foods of animal origin are: milk and milk products (cheese, yoghurt, but not butter), meat, poultry, fish, shellfish, insects and eggs.

The main body-building foods of plant origin are legumes (peas, dried beans, lentils and niebe beans), to which nutritionists generally add peanuts, soybeans and some seeds (cotton, sesame, etc.). These foods provide a substantial amount of proteins, but the quality of these is poorer than that of animal proteins; on the other hand, they cost less.

2) Energy-rich foods

This is a very heterogeneous group, since some foods provide practically nothing but calories, while others contain calories, proteins and vitamins.

Carbohydrates form the bulk of most diets, providing 60 to 80% of the energy ration. Cereal grains (wheat, millet, rice, maize, sorghum, etc. provide some proteins as well as energy, whereas roots and tubers (potatoes, manioc, etc.) are practicaly devoid of protein.

For example: 500 g of millet provide 50 g of protein, whereas 500 g of manioc only provide 5 g.

Sweet bananas and plaintain bananas are often included in this category.

The carbohydrate group also includes sweet substances: sugar (cane or beet sugar), honey, sweets, jams, dried fruit.

Foods rich in lipids (fats), also provide calories.

They may be of animal origin (butter, suet, lard, fish oils) or of plant origin (palm, coco, palm kernel, peanut, soy and sunflower oils, shea butter). The body needs fats.

3) Protective foods

These are foods rich in vitamins and minerals. They are highly varied: vegetables, leaves and fruits.

We must remember that diet includes beverages, and especially water, which is essential to life. A person will die of thirst more rapidly than of hunger. Beverages include flavoured drinks (herb teas), sodas and commercial fruit juices (often very sweet) and alcoholic beverages (wine, beer, whisky, traditional preparations). The latter are rich in calories.

II. DIET AT DIFFERENT AGES

Dietary requirements vary from one person to another, with age, working conditions, etc., and this leads to differences in food intake.

The best food for newborn babies is their mother's milk, which in itself covers all of their needs during the first months of life, in the majority of cases. Toward the age of four to six months, breast milk becomes insufficient, and children should be gradually introduced to complementary foods. Mothers continue breast-feeding, but also give their child other food, chosen forits appropriateness to basic needs, and especially to growth, to the child's digestive capacity and to local resources. This complementary diet is composed of porridge made of local foods such as cereal grains or roots and tubers. Since no single one of these foods is completely balanced, food combinations should be recommended: an energy-rich food should be associated with a protein-rich food. For example, a cereal grain, root or tuberplus a food containing animal proteins (meat, fish) or plant proteins (beans, peanuts, etc.).

At first this diet is very liquid, and it is thickened as the child grows. It should be of high quality, well cooked, prepared at the last minute and given using a spoon. Care should be taken to provide a sufficient number of meals, since children's dietary requirements are high, but their digestive capacities are limited. Gradually, children should be given access to the family dishes: theoretically, they may eat everything at age one year, but every effort

should be made to furnish small children, with qualitatively and quantitatively sufficient rations of proteins and calories. When the family dish contains proteins, a portion of it should be reserved for them.

Indeed, the risks of malnutrition are greatest and most serious during the first 18 to 20 months of life. The protection provided by breast-feeding diminishes, thus upsetting the fragile balance in the child's nutrition. A monotonous, essentially carbohydrate diet and dishes always containing the same single ingredient, should be avoided.

Towards age two, children may eat like adults, but attention should be paid to the quantity and quality of food, its diversity and the frequency of meals.

Children may be made aware of questions related to a balanced diet at a very early age. Common foods may be drawn on cards, for example, and given a code corresponding to their function (body-building foods are given a red sticker, protective foods a green one and energy-rich foods a yellow one), and children are taught to group foods or to establish menus by choosing at least one food from each group.

III. GROWTH

Children's physical growth is very rapid during the first years of life. It may be observed by measuring their height and weight regularly. This activity may be used with groups of children, and introduced progressively, using the method described here.

Surveillance of children's health and nutritional status is facilitated by growth charts, which represent height and weight measurements graphically. When performed and recorded systematically, these serve to detect some health problems: this is preventive action.

Most countries use such charts, of which some examples are shown here. They are a part of individual health cards, which are distinct for boys and girls, and contain information on their identification, vaccinations, etc.

Once the child has been weighed or measured, the attendant looks for the line on the chart corresponding to the height or weight, rounded out to the lower figure, and follows it horizontaly to the right until it intersects with the "age" column for the current month.

A dot is made at that point, and it is linked with the dot made at the previous measurement. Any downward movement of the curve in comparison with the reference curves (often called the road to health) is a warning sign, as is the stagnation of weight between two measurements. A visit to the health centre is then required. If the curve parallels the reference one, growth may be considered satisfactory. If it is far below the lower curve, however, the child should receive strict, regular surveillance.

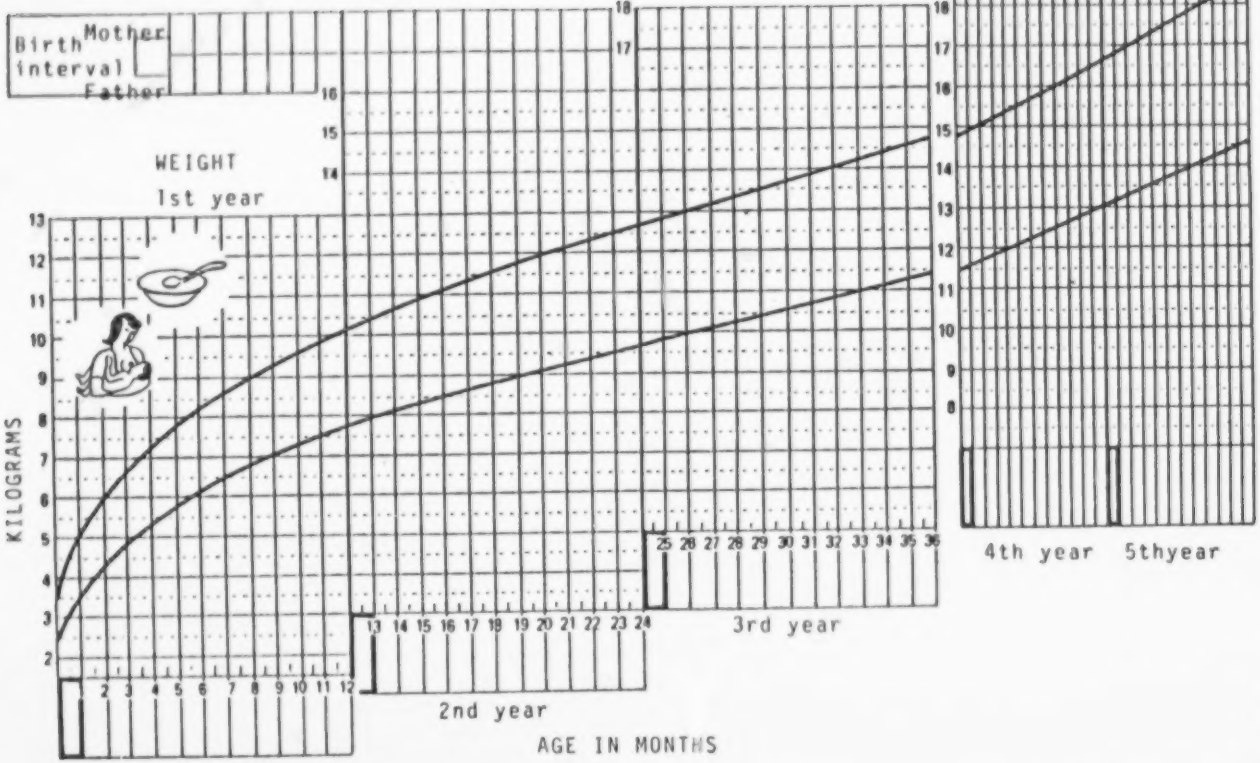
For further information on these questions, the reader may refer to the following issues of "Children in the Tropics":

N° 126
N° 135/136/137
N° 138/139/140
N° 147/148
N° 158
N° 160/161

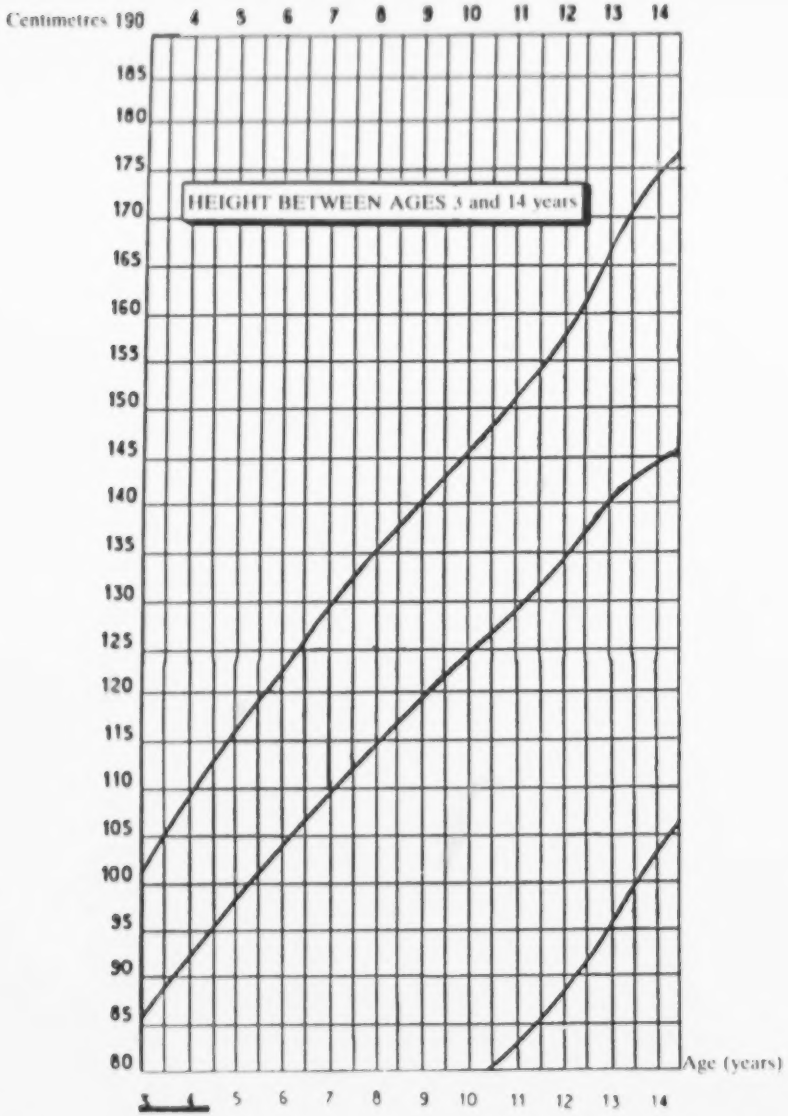
REASONS FOR SPECIAL CARE

Name .....

Weight at birth ..... kgs



HEIGHT CHART FOR 3 TO 14 YEAR-OLDS
(M. Sempé, 1965. These curves
are similar to those found in Dakar)



APPENDIX 3

SOME INFORMATION ABOUT WATER

1. GENERAL REMARKS:

Everywhere in the world, water is recognized as a symbol of life, and every religion worships a rain god or uses water as a means of purification. Without water, the Earth would be a dead planet, like the moon. Life first developed several billions of years ago in the primaeval oceans. All forms of life, be they plant, bacterial, animal or human, require water in order to develop. When deprived of water, human beings die within 3 to 5 days. The catastrophic effects of drought have been illustrated recently in many parts of the world, ranging from the Sahel to Ethiopia and to Brazil. Conversely, an excess of water is also dangerous; as may be seen by the tidal waves, flooding rivers and devastating rains that ravage some areas at regular intervals, killing people, destroying their achievements, and eroding the soil.

2. THE CYCLE OF WATER

As opposed to our planet's reserves of various minerals, coal, petroleum, etc., its water supply can neither be exhausted nor decrease, since the earth's water follows a continuous cycle (see figure). It evaporates, in the form of water vapour, over the surface of the oceans and seas, but also over lakes and forests. Clouds are formed, following condensation of this vapour at a certain altitude, and are pushed by the winds. Through the action of complex meteorological phenomena, water returns to the ground in the form of rain, snow or hail. There, it may either evaporate and form clouds again, or filter into the ground, to maintain the water supply table, flow over the ground, swell the rivers that run into the seas, oceans or lakes, or be captured by people and used for their own needs (agriculture, industry, etc.).

3. AMOUNTS OF WATER, ITS DISTRIBUTION AROUND THE WORLD

There seems to be an endless supply of water: seas and oceans cover 2/3 of the earth's surface. The total volume of water on the planet is estimated at 1,34 billions of km^3 (1 km^3 of water equals 1,000 billion litres, or 1,760 billion pints). 97% of this is salt water, while 38,3 million cubic kilometres are fresh water, 29,5 million of which are contained in glaciers and in the polar icecaps. Of the remaining 8,8 million km^3, 8,6 are located in underground reserves. Most of the water used by human beings comes from rivers, which contain 1.250 km^3 at any given time. However, owing to the cycle of water and to the renewal of this running water, the amount of water available annually is approximately 35,000 km^3. This apparently considerable volume is very unevenly distributed around the world. Photos of climatically different regions of the Earth provide a picture of the importance of water for the environment and the vegetation: they show desert areas such as the Sahara, with its sand dunes, arid regions such as the Sahel, the Brazilian Nordeste, some parts of Mexico, China and the USSR..., temperate regions such as Europe, tropical forests such as Central Africa, Amazonia or the jungles of South-East Asia. In some villages located on the edge of a desert, water must be sought at a depth of more than 100 metres (330 feet) or fetched from places several kilometres away. In other countries an overabundance of water creates marshland unfit for farming, in which mosquitoes and other insects proliferate.

In addition to the uneven geographic distribution of water, there are also great differences in the temporal distribution: dry seasons and rainy seasons alternate in sub-tropical areas, while the temperate zone has a relatively regular rainfall throughout the year, although the total amount of water received annually is not necessarily any greater.

Faced with these variations, people have always attempted to improve the regularity of their water supply, through irrigation techniques, channeling water, wells, dams, reservoirs, land rehabilitation to eliminate excess water, dikes and piers for protection against water, and riverbank farming in order to take advantage of flooding.

4. WATER AND PEOPLE

Water is a part of the everyday life of all men and women. It has a multitude of uses: drinking, washing, playing, cooking, cleaning, watering plants, transforming products industrially, transporting merchandise, producing electricity, etc.

People (and animals), tolerate the lack of food more easily than the lack of water. Interestingly, the vocabulary pertaining to the need to eat is rich (hunger, appetite, craving, gluttony, voraciousness, bulimia, piggery), whereas there is only one expression for the need for water: thirst, which indicates how imperative a need this is. Similarly, there are several words to express deprivation of food (abstinence, fasting, starvation), but none for deprivation of water.

In everyday language the imperative nature of thirst may be judged by the existence of expressions aimed at emphasizing certain passionate, urgent desires: thirst for knowledge, thirst for love, thirst for independence, thirst for power, thirst for truth.

Water is present in all body tissues, in all of the body's cells, be they in the liver or the brain, in muscles or in bones: we speak of an intracellular compartment. Water circulates between the cells as well. It is also present in the blood. The body's total water content varies with age: it represents 90% of the fœtus' body weight at the end of the first trimester of gestation and 75% at birth. This percentage decreases gradually, reaching 60 to 65% at adulthood. It also varies with the amount of fatty or fibrous tissue within the organism, since these contain relatively less water.

Water is the solvent for many of the substances present in the body: glucose, urea, potassium, sodium, bicarbonates, sulfates, etc. Exchanges are constantly occurring between compartments, in order to ensure a permanent equilibrium in the concentration of the dissolved particles in the various mediums (osmolarity). When one compartment shows a certain degree of dehydration, or hyperosmolarity, water crosses from the normal compartment to the dehydrated one in order to restore the equilibrium.

Water plays a central role in the circulation of the substances essential for life. "As it circulates, water carries nutrients and wastes with it; that is, it establishes permanent exchanges between the human organism and the outside world" (1).

The water balance is always equilibrated: intakes compensate for losses. Losses occur through the lungs, by breathing (during exhaling it is easy to detect the presence of water vapour as it condenses on a glass held in front of the mouth, for instance), through the skin perspiration by and sweat (which play a role in the regulation of the body temperature), through the kidneys by urine (approximately 200 litres of blood transit by the kidneys daily, to produce about one litre of urine containing the waste products of the body's metabolic processes) and through the faeces (water not absorbed by the intestine).

Intake takes the form of beverages, water produced by the oxidation processes of the organism, and water containing by foods. The latter may be evidenced by cooking green leaves, or observing the volume of rice, which absorbs the water in which it is cooked.

The equilibrium of the water balance is disturbed by any decrease in intake or by an increase in losses during diarrhoea or severe vomiting, or by a "sunstroke". A disturbed equilibrium always results in dehydration, which leads to death if it is not corrected by an increase in intake (see issue 158 of this journal).

5. THE QUALITY OF WATER

Water also endangers people's health directly: it is the medium in which many insects and micro-organisms live and proliferate: these viruses, bacteria and parasites cause diarrhoea, cholera, dracunculiasis (Guinea worm), schistosomiasis (bilharziasis), malaria, onchocerciasis, leishmaniasis, trachoma, etc. Figures (1) and (2) show two examples of the cycles of parasites for which water is a necessary substratum conditioning human contamination. Water may also be polluted by waste products, and by toxic substances of agricultural or industrial origin (petroleum products, synthetic detergents, chemicals, fertilizers, pesticides, radioactivity).

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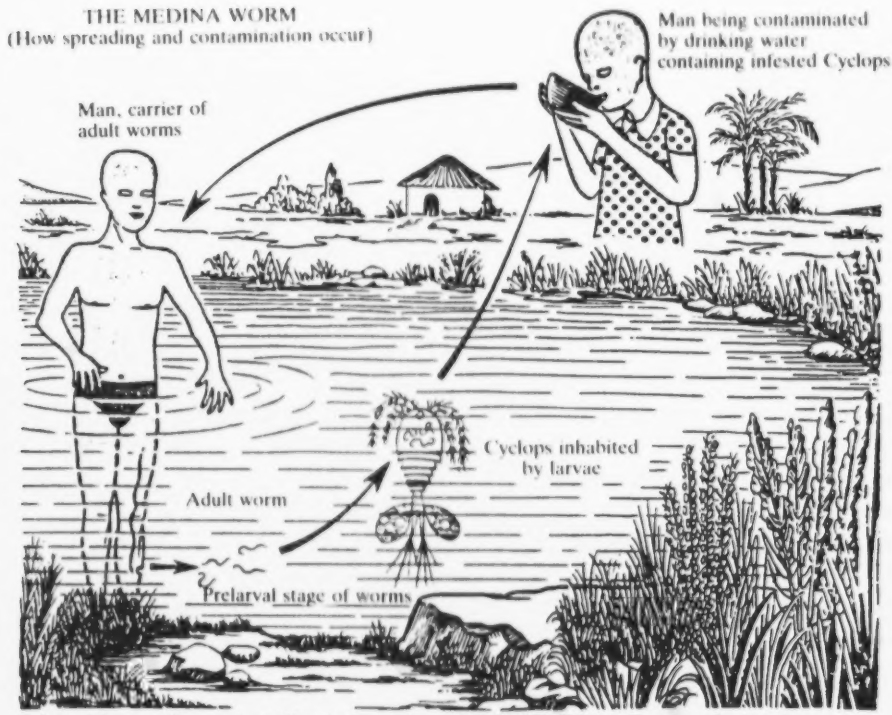
(1) Les Maladies de l'Eau by J.F. Desjeux (p. 195) in L'Eau: quels enjeux pour les sociétés rurales?, D. Desjeux, Ed. L'Harmattan, 1985.

The quality of water is essential to its use as a beverage: acceptable drinking water must possess a number of physical, chemical and biological features as well as some organoleptic qualities appreciated by consumers. The expected colour, taste, odour and temperature of drinking water vary with people's habits. Some groups appreciate slightly salted water while others dislike it. Some communities find slightly clouded water acceptable, while others, close by, will not tolerate it.

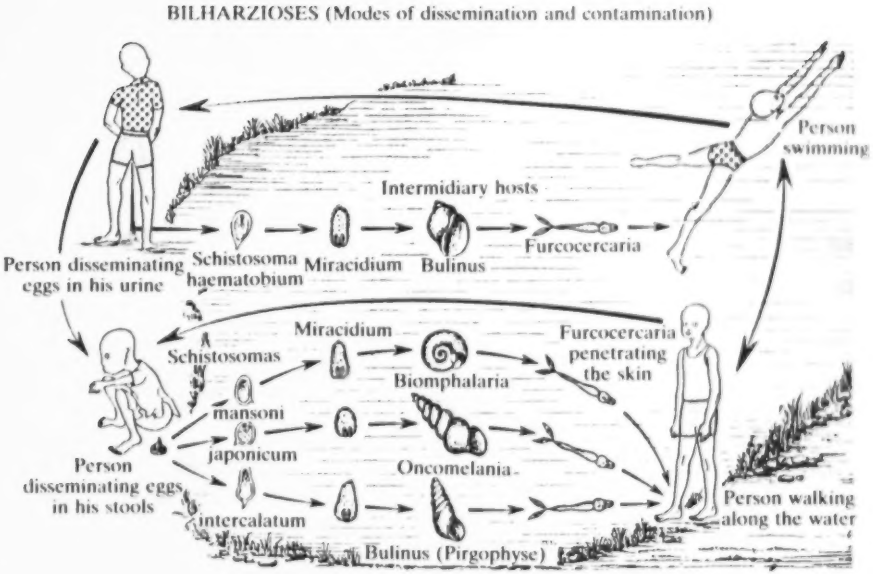
The greatest danger resides in the bacteriological quality of the water used in homes: the bacteriological purity of underground water drawn from wells that reach the water supply table or from springs is correlated with the depth of these. Furthermore, they must not be dirtied by human or animal excrements, nearby latrines or marigots, or by improper water-drawing or utilization techniques (practical examples of techniques for protecting wells and capturing springs are presented in issue 115 of this journal). Most surface water

Figure 1 : Life cycle of the Medina worm or Guinea worm


THE MEDINA WORM
(How spreading and contamination occur)
Man being contaminated by drinking water containing infested Cyclops
Man, carrier of adult worms
Cyclops inhabited by larvae
Adult worm
Prelarval stage of worms

Adapted from: « Parasitologie Tropicale », M. LARIVIERE, Edition Foucher, Paris 1978.

Figure 2 : Evolutive cycle of schistosoma.



(streams, lakes, reservoirs) is pemanently contaminated and must receive treatment before use as a beverage or for washing fruits or vegetables which will not undergo prolonged cooking.

The complexity of the treatment depends on the quality desired: they range from simple filtering through a clean cloth, which eliminates Guinea worms, through decanting, home or village sterilization using chlorine, boiling or special filters, to biological decomposition processes or purification plants which treat water in order to make it fit for consumption by city residents.

Various means of storing water in homes may cause contamination when cleanliness rules are not respected: containers should be covered and washed regularly, water should be changed often, used water should not be poured back into a container.

In the rural areas of the Third World, 3 people out of 5 do not have access to clean water, however. While drinking water is piped into the residential neighbourhoods of cities, it is rare and often expensive in the overcrowded poor neighbourhoods: as much as 10% of the meager income of these underprivileged families may be spent to purchase it. Clean water is an essential precondition for health, however. WHO considers the number of water taps per 1,000 inhabitants to be a better indicator of health than the number of hospital beds, and the high quality of drinking water to contribute more to improving health than any vaccine or medication.

When evaluating the quality of water we may also take into account all of the solids suspended or dissolved in it, the concentration of which depends or dissolved in it, the concentration of which depends on the composition of the soil through which it has filtered, as well as the pollution it has undergone. For instance, water drawn from a stream or a well may be clouded by suspended particles which settle after a period of rest. It also contains dissolved elements such as iodine, fluorine, iron and manganese salts, sulfates, chlorides and carbonates, which contribute to the balance of these trace elements in the human body when the water is consumed. In areas where iodine deficiency is frequent, the iodine content of water may be low. Water containing little fluorine may be a contributive factor in dental carie. Conversely, water polluted by mercury, nitrites, lead or arsenic may endanger the health of those who drink it. Modern industrial and agricultural development requires the strict control of the quality of water. The minimum amount of water required for drinking and basic hygiene is estimated at 30 litres per day and per person, on the average. In many regions this figure is far from being reached, however, while in others much water is wasted as a matter of course: in Sweden, for example, consumer needs amounted to 285 litres/person/day in 1954, and 500 litres/person/day in 1980.

Improving the supply of water and its cleanliness, learning individual and collective attitudes and behaviour aimed at protecting available sources of water and using them rationally, are all parts of a preventive approach to health.

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